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# REPORT

ON THE

## Salt Resources of Goderich,

PROVINCE OF ONTARIO, (CANADA WEST.)

BY

C. A. GOESSMANN, Ph. D., SYRACUSE, N. Y.

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The town of Goderich, County of Huron, Province of Ontario, Canada, is located upon elevated grounds along the southern bank of the Maitland River, at its entrance into Lake Huron. It covers a considerable area of level land, and contains about 4000 inhabitants. The majority of its private dwellings and stores are of a respectable character. The Streets, which are wide and spacious, radiate from the stately Court House, which, from its size, and the extent of the public grounds surrounding it, represents the most prominent feature of the Town. The salubrious atmosphere, due to its peculiar location, has given to the town some reputation as a desirable Summer resort.

The Northern Branch of the Grand Trunk Rail Road terminates within the Town limits. Three passenger trains leave, daily, the extensive R. R. Depot, by way of Stratford, for the East and the West, while a single R. R. track enters the Maitland River Valley, running along the bank of the River to the

*[Syracuse N.Y. 1868]*

wharfs in the Harbor of Goderich, where an extensive Freight Depot completes the Rail Road arrangements for Lake freight transportation.

The Harbor of Goderich, at the mouth of the Maitland, is protected by two projecting bluffs, and is quite spacious and easy of access for vessels of every description, which maintain direct communication with the ports of the lower and upper Lakes during the season of Navigation.

The Maitland River encircles the Town from N. to E. of S. E.; its bed gives evidence of a considerable change of its volume of water at different seasons, or, in consequence of particular local meteorological causes. The peculiar way in which the main body of water has worn out a part of the River bed in the vicinity of Goderich, presents decided advantages to render the River for several miles upwards, navigable; the construction of one or two locks, with some dredging, would secure direct navigation from the Lake to the localities which are favorable to the erection of works for an advantageous development of the peculiar resources of Goderich. The banks of the river within the vicinity of Goderich are either abruptly rising towards the Town or ascending gradually in form of terraces. The present water-mark of the River is from eighty to one hundred feet below the level of the adjoining mainland upon which the northern and eastern part of Goderich is located. A note worthy feature of the Maitland River is its frequent and abrupt windings, a fact which manifests itself not only in the vicinity of Goderich, but characterizes its whole course from its source to its entrance into Lake Huron. Its main direction is for 6 to 8 miles S. E. along the Grand Trunk R. R., turning suddenly to the N. E.

The lands which border on the Maitland River Valley, are mainly level, (with here and there slight undulations,) and are but partially under cultivation. The soil consists of a considerable depth of a drift, composed near Goderich, of a gray clayish soil, which is largely intermixed with sand and gravel, and is apparently very productive. The general aspect of the country at large is that of a rich woodland. Forests of Beach,



Maple, Ash and Oak, extend one hundred miles or more along the lake shore through Huron and Bruce Counties northwardly, and also Lampton County, towards the South. The Lake shore as a general rule is represented to be easy of access, affording a direct shipment of wood and lumber, by Lake, to the localities desired.

Until quite recently Goderich presented but little interest beyond the mere fact of being a healthy and pleasant Lake shore town, located at the Northern branch of the Grand Trunk Rail Road, and serving as a convenient place of transit from Canada to the Michigan and Upper Lake Ports. To-day, Goderich claims to possess within its own limits and its immediate vicinity, a Salt resource of considerable extent and of superior quality. The discovery of this valuable resource was accidental. Parties engaged in searching for oil resolved to close up their works, without regard to results, by going to the depth of one thousand feet. Having attained the depth of 960 feet, a highly saturated brine was struck, instead of oil, and the well was at once converted to the manufacture of boiled salt, and is yet the only one worked for the purpose of making Salt, at Goodrich.

The first information of the existence of a salt manufacturing establishment at Goderich came into my hands through the office of the Salt Co. of Onondaga, about the 30th March, 1867, by a circular issued by Geo. Rumball & Co. of Goderich, dated Dec. 21, 1866, in which they announced the completion of their works. The actual manufacture of salt commenced, I presume, late in the fall of 1866.

The mere fact of striking salt water instead of oil, changing the basis of operation from oil to salt, would have attracted little attention, had not the advertisement been accompanied by a letter of Professor T. Sterry Hunt, a distinguished chemist of Montreal, in which he states his analytical results with the remarks, that the Goderich brine was the most concentrated possible and, at the same time, the purest known. A glance at the analytical statement could not but confirm me in the correctness of his conclusions. Professor Hunt says, "the

brine tested was obtained on the 24th August, 1866 : its specific gravity was found to be 1.205 equal to 100 degs. salometer. One thousand parts of the brine contained

Common Salt	259,000
Gypsum,	1,882
Chloride of Calcium	0,432
“           Magnesium,	0,254
	<hr/>
Saline matter,	261,568

Professor Hunt adds, “it appears that a wine pint of that brine will yield 2260 grains of salt and that 21.6 gallons will give a bushel (56 pounds) of salt,” &c., &c. Taking into consideration, under such circumstances, the geological character of Goderich and vicinity, a quite lively interest was felt, and personal local enquiry in regard to the nature and the extent of the newly opened salt region decided upon. The results thus far arrived at by myself may be summed up in the following statement :

Firstly. The present brine of Goderich is not only one of the most concentrated known, but also one of the purest (*a*), if not *the* purest, at present turned to practical use for the manufacture of Salt.

Secondly. That the salt bearing region apparently extends for more than *twelve* miles S E. of Goderich, and thus covers, a much larger area, than at present has been established.

Thirdly. That Goderich possesses, in a high degree, all necessary additional resources and facilities for the manufacture of salt and its transportation to all the important commercial points on the Western Lakes, and is therefore the most formidable competitor the Salt works of the State of New York have ever yet had to contend with.

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In the following pages I shall present some of the most important details obtained in the course of my examinations and inquiries upon which the foregoing three statements are based.

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(*a*) I had no chance to examine the brine of Saltville, Va.—and prefer on that account to speak less positively here.



Soon after receiving the information above mentioned, samples of brine and salt from the Goderich works were received from reliable parties. The brine thus obtained (April, 1867,) was perfectly clear and colorless, and remained in that state for some time ; it settled afterwards a small quantity of Gypsum (commonly called Plaster): no trace of Peroxyd of Iron can be noticed in that sample of brine even at the present time. I subjected the brine to a careful analysis, which gave the following result :

Specific gravity 1.195, equal to 95° Salometer at 58° Fahr.

One thousand parts of that brine contained

Common Salt	241,433
Gypsum	5,433
Chloside of Calcium	0,216
“ “ Magnesium	0,336

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Saline matter 247,418

The two samples of brines tested by Prof. Hunt and myself differ in the strength about 1.75 per cent of (Salt) Chloride of Sodium. The difference in regard to the per-centage of Gypsum, which affects but little the relative commercial value, may find satisfactory explanation either in variations of the salt deposits, &c. from which the brines originated, or in the circumstances under which the saline solutions have been formed. The per centage of Gypsum obtained by myself, is still somewhat less than that contained in the brines of Onondaga, N. Y. Comparing the results of both analyses, in regard to the percentage of Chloride of Sodium contained in the Goderich brines with that known to be in the average brines of Onondaga (about 16 per ct.), we notice that the Goderich brine in either case exceeds the former by 50 per cent of salt, or more; whilst the percentage of obnoxious deliquescent chlorides contained in the brine of Goderich, amount only to 1-4 or 1-5 of that found in the brines of Onondaga.

A sample of salt from the Goderich works gave the following results :

Sulphate of Lime (Gypsum)	1,4306
Chloride of Calcium	0,0072
“ “ Magnesium	0,0313
“ “ Sodium (salt)	97,0309
Moisture	1,5000
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	100,0000

This sample of Salt in a dried state would contain not less than 98.5 per cent. of chloride of sodium or pure salt ; it ranks consequently foremost among the common Fine Salt (boiled) in the market. The percentage of the deliquescent chlorides of calcium and magnesium, compounds, which are considered the most obnoxious component parts of brine or salt, compares most favorably with the best foreign and domestic Salt. In fact the composition of the Goderich brine is such as to warrant a priori, with but little care, a superior salt—Common, Fine and Coarse. The commercial value of the brine of Goderich, in consequence of its superior purity and strength as compared with the brine of Onondaga is, judging from the previous statements, quite obvious. The Michigan and Ohio River brines, I need scarcely add, have still less chance to compete successfully on anything like equal terms.

I improved, subsequently, my chances for gathering information, by visiting twice the Town of Goderich and its vicinity. I was at Goderich for the first time, during the latter part of June, 1867, and again towards the last of December of the same year. At my first visit I saw one well with boiling works attached to it, and heard of another one being fairly started. I found the first well on each visit in good running order, fully supplied with brine, and turning out a large amount of most superior Salt of a fine grain and in appearance similar to the Liverpool Fine. The samples of brine and salt, of which I stated the analyses above, were taken from this establishment.

The following is a brief description of the first Salt Manufacturing Establishment at Goderich: The *well* and *works* are



located upon the North side of the Maitland River ; east of a large bridge, which secures the communication between Goderich and its outskirts on the opposite river-bank, upon an elevation of about 25 or 30 feet above the present water mark, and about one mile and a half from the mouth of the Maitland River in the Harbor of Goderich. The well is stated to be exactly 1000 feet deep, with iron tubing to almost its entire depth.

The pump, which has been connected with it for raising the brine to the supply tanks of the boiling works, is but two inches in diameter and is worked by a twenty-five horse power engine. The original bore of the well is five inches in diameter—the upper portion of the iron tubing is stated to be four inches, while its lower portion is smaller.

The fresh water circulating between the various layers of limestone, which overlay the saliferous rocks, rises within eight feet of the surface of the surrounding grounds in its immediate vicinity ; the brine itself partaking but little of an artesian character. The grounds in the rear of the works ascend quite abruptly to the general level of the lands along the Maitland River in that District. They report, that in sinking the well, they passed through from 25 to 30 feet of coarse gravel, (drift-mass) after which they entered a series of layers of harder and softer greyish limestone—sometimes interlaid with a similar colored softer clayish deposit, usually of limited thickness. After having reached the depth of 960 feet, much softer rocks were struck ; they noticed for the first time in entering them a saline water of considerable strength, and ceased boring after perforating these softer rocks 40 feet, making the entire depth of the well 1000 feet. These softer rocks are represented to be layers of Shales, Gypsum and Rock Salt. During the first attempt of pumping it is claimed there were brought to light, suspended in the brine, real crystals of Rock Salt. Whatever the real fact of the last statement in that particular may have been, I do not presume to decide. I do not, however, hesitate to express the belief, that, at least, a real salt deposit in a very pure state could not be far off from a locality, from which

brines of the composition and concentration as above had been taken.

The sudden change (in that well) from fresh water to a strong brine at the depth of 960 feet could, in my opinion, only find a satisfactory explanation in the presumption of the fact, that an impermeable clayish strata (shale) must have excluded, quite successfully, the fresh water drainage of the upper layers of limestone, &c., from the lower saliferous rocks; for whatever in the course of time, by a natural diffusion of saline solutions towards the surface might have been left undone, the plunging of the drill and the sand pump during the process of boring, must have accomplished in but a few operations. Although at that stage of development of the salt resource, some grave objections might have been raised against some of the details of an opinion, then current at Goderich, in regard to the character of the supply, yet there remained in my mind but little doubt about the correctness of the main feature, namely, close proximity of Rock Salt of an apparently extensive character. Facts have since transpired, which for the force of argument, I may introduce here, in advance of their detailed description in proper connection, which have settled further controversy on these points. Rock Salt has been struck at Goderich, three-fourths of a mile south east of the first well heretofore described, and also, quite recently, at Clinton, twelve to thirteen miles south-east of both wells. Some difficulties in regulating the amount of brine were encountered as soon as actual work for the supply of the boiling works began; these troubles (as I am informed) have entirely ceased, and the brine has been furnished, for months past, of a quite uniform quality and quantity, pumping only eighteen hours per day. At the beginning, when taxing the well beyond a certain limit, they either exhausted the supply, or reduced materially, the strength of the brine. Proper precautions, as I stated, have been taken since, in consequence of which it appears, that the concentration of the brine fluctuates within narrow limits, from  $93^{\circ}$  to  $95^{\circ}$  Salometer, at  $58^{\circ}$  Fahr. I have tested the brine twice (June and December of the past year) di-



rectly from the well. I noticed on these occasions but little variation in its strength within the limits above stated, and feel on account of that fact, quite satisfied concerning its present stability in quality. The daily supply of brine has been sufficiently established to warrant the practicability of adding a third block of sixty kettles to the present establishment—counting thus, three blocks of one hundred and sixty-two kettles to one well, with a two inch pump. The proprietors of the works expect to meet a part of the larger supply of brine required for the future, by pumping continually—i. e. twenty four hours instead of eighteen hours, their present practice.

The boiling works consist at present of two blocks of fifty-two kettles each : the capacity of the kettles ranges from 120 to 140 gallons ; five men are in attendance during the day and three during night, besides the engineer for the pump. The cleaning of the kettles, by means of fresh water during daytime, accounts for the increased force of workmen during that period of time. Sixteen cords of hard wood are consumed, of which one cord and a half have to be counted for running the pump ; a cord of hard wood costs two Dollars. \*A barrel for packing Salt costs thirty cents ; wages are from one dollar twenty cents to two dollars. The blocks are very substantially built, and are supplied with four large tanks for receiving the brine from the pump, serving thus as storage rooms for the brine. No process of settling the brine is practised. The blocks are still on Sunday, according to State Law. The only difficulty the parties at Goderich have to contend with at present, is the rapid incrustation of the kettles, a trouble due to the strong concentration of their brine in connection with their peculiar system of manufacture. The Salt separates under existing circumstances largely in a fine grain, which in consequence of the intense heat applied, bakes in considerable quantities to the bottom and sides of the kettles, forming thereby within twenty-four hours an incrustation (bitterns) of several inches thickness—a result which causes not only a considerable waste of Salt fit for the market, but interferes also very seriously,

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\*All prices stated in connection with the Goderich Salt Works are in gold, if not otherwise mentioned.

with an economical application of the fuel. The Salt is after separation from the pickle (mother liquor) as might have been expected from a brine like the Goderich, of a superior color, of a hard and fine grain, resembling the best brands of home and foreign manufacture, and that success is attained without any but ordinary care required for the manufacture of common Fine. It will be noticed that the sole objection, which may be raised against the Goderich brine is merely incidental—for the brine is too strong, to be worked to its full advantage by the system of manufacture at present pursued; evaporation by more moderate heat—for instance on the European plan of large pans &c., or evaporation by solar heat in wooden vats on the Onondaga plan, would no doubt prove more successful; each of these methods would produce with less trouble not only a very good marketable article of its kind, but secure what is most important—the full percentage of Salt, which might be expected comparing its concentration for instance with the brines of Onondaga, a difference of 50 per cent. As time will surely remedy the present condition at Goderich, it will be but fair to presume equal experience and skill in the management of the manufacture of Salt, when the question of the chances of the Goderich Salt for competition in the general market shall be discussed in some of the following pages of this paper.

Taking this view, I need scarcely add, that the subsequent statements concerning the present financial operations of the Goderich salt works, may claim more interest on account of what they *suggest*, than what they now *present*. The salt manufacture is carried on by a joint-stock company; the original stock for sinking well and constructing the block, &c., was ten thousand dollars (the expense of sinking well was \$6000); when the manufacturing of salt began, the capital was increased by an additional subscription of \$4000, of which but \$700 were required to be called in. The Company manages its business through one of its stockholders, and all the salt made is sold to one party at one dollar twenty-five cents per barrel at the works. Six months after the works commenced operations, a dividend of 15 per cent. was paid to the stockholders; and at



the end of the year a further dividend was declared of 35 per cent., making a clear profit of fifty per cent. for the first year in spite of many incidental expenses arising from a first attempt at starting an entirely new business, and a production of salt three to four bushels less to a cord of hard wood, than at Syracuse, where a brine is worked which contains fifty per cent. of salt (Chloride of Sodium) less, than that at Goderich.

The following figures are given to me as a fair representation of their expenses for the past year ; six days operation every week ; ten months operation ; 95 to 100 barrels per day ; 24,000 barrels annual production. One hundred barrels cost, as follows, viz :

Wood,	\$32
Labor,	20
Barrels,	30
Cartage,	6
Oil, &c.,	1
Interest on Capital,	3
	<hr/>
	\$92

Leaving to stockholders, even at those figures, \$33 per 100 barrels over and above seven per cent. interest on the capital invested. If, in addition to these figures, we take into consideration, that the cord of hard wood, at present produces but  $34\frac{1}{2}$  bushels, which at a low estimation is but two thirds of the amount we might expect, judging from analogy, we are forced to the conclusion, that the prospects of the Company are highly flattering. In consequence of the great success of the first enterprise a lively interest was aroused at Goderich ; other parties embarked in the *new* business ; a second well was started about three quarters of a mile to the south-east, upon the opposite side (south side) of the Maitland River, and in close proximity to the freight house of the Grand Trunk Rail Road.

In sinking the well they passed through 95 feet of clay and gravel, entering subsequently the same series of sandstone

and clayish limestone rocks, which had been met with in the first well, and also the shales ; they stopped boring at the depth of 1101½ feet after having penetrated fifteen feet of rock salt. The well was finished after eight months working, November last, 1867. I examined this locality during my second visit, December, 1867, of which I shall speak from hence. Many changes could be noticed after an interval of six months. The first salt works, doing an extremely profitable business; Rock Salt struck within the outskirts of Gooderich ; the confidence in the extensive character of the Salt resource greatly strengthened; seven derricks, lining both sides of the Maitland River, erected,<sup>3</sup> of which four stood close to the R. R.; privileges for switches to the contemplated works, secured ; contracts for the construction of works offered ; part of the building material for some of the works procured, and ten companies reported to have been organized. There were apparently but three causes which governed the situation, viz, ; the period of time (6 to 8 months) required to sink a well through 800 to 900 feet of hard rock ; secondly, the lateness of the season, and thirdly, the want of capital, owing to extensive losses in oil speculations. In addition to these causes may be stated, that a certain class of business men, in consequence of the recent report, that rock salt had been struck at Clinton, 12 miles south east of Gooderich—within one to two hundred yards of the Grand Trunk R. R., concluded there was *too much salt* to make its manufacture pay under the present commercial situation of Canada.

The consumption of salt outside of those parts of Canada, which can procure English salt at low cost, is set down to be equal to six hundred barrels per day. The leading men of Goderich are fully aware of their condition, and feel by no means discouraged ; they are prepared to offer inducements to outsiders to get started ; they hint at protective home legislation in certain emergencies, and feel quite confident, trusting in their superior resource of valuable brine, their extensive supply of fuel and lumber and their decided advantages of transportation, to be able at a not very distant day, to enter



our lake shore markets, even under the present tariff. Whether their expectations may be realized I propose to answer by treating the points of advantages raised, in addition to what has been said in the foregoing pages, somewhat more in detail, each one under its particular heading.

*Resources of the supply of Brine at Goderich and its vicinity.*

When describing the observations made at the first well, I reported the presence of rock salt at the termination of the well was supposed to be proved beyond doubt in consequence of bringing up fine crystals of rock salt suspended in the brine, by aid of the pump, which raised the latter. As no sample of rock salt, thus obtained, could be produced for identification, I hesitated somewhat in accepting the theory, then favored at Goderich. I held the opinion, that such a rapid change from saturation to even seventy-five degrees Salometer and back again could not be presumed to be due to a mere contact of fresh water with solid rock salt in so short a space of time; the presumption of saliferous rock permeated with fine crystals of salt appeared to be a more probable cause. Whatever may be the local condition of salt, is in itself, here, of no particular consequence, since one year's operation has settled all doubts about a sufficient supply of superior brine to insure an advantageous working in that instance.

The second well, which as I stated before, is sunk on the opposite side (south side) of the Maitland river, at a distance of about three-quarters of a mile from the first one towards the south-east, has established the presence of Rock Salt. One of the proprietors of that well, the Hon. M. C. Cameron, Member of Parliament from that district, procured me some samples of Rock Salt as furnished by the sand pump: they entered, according to his statement, fifteen to sixteen feet in the Rock Salt. These samples of Rock Salt gave by their peculiar fracture and size, evidence of a colorless Rock Salt deposit of great hardness. I visited the well for the purpose of collecting brine for analysis, and testing its depth. I failed to succeed, for the well being tubed to 150 feet, had filled up partly with a clayish mud, in consequence of the fresh water drainage; the water

stood to about 150 feet below the surface, and it was fresh on top; the mud, which stuck to the test bucket, was of a decidedly pure saline test, and resembled much in color a mass of crushed blueish shale of the Onondaga Salt groupe in our vicinity. Taking all the various information obtained in regard to the second well into consideration, and the conclusions we have to arrive at are quite obvious; the actual presence of Rock Salt, renders, under the accompanying circumstances, a good supply of superior brine quite certain. The general confidence in these conditions manifests itself in the fact, that from four to five derricks have since been erected in the neighborhood of the second well lining the R. R. Track to the east and west. The extent of ground thus far explored would in itself be sufficient to support the manufacture of Salt on an extensive scale. The discovery of Rock Salt at Clinton (from 12 to 14 miles to the south east of Goderich) under similar geological conditions, has added much to satisfy all parties in regard to the question of an abundant supply. The well at Clinton is owned by Mr Ransford : I have visited the locality. The well was finished but three weeks before my arrival. Mr. R. was absent; he resides in England and had left for that country to complete arrangements for the erection of Salt Works.

It is stated they passed through about 80 to 90 feet drift mass, then through 960 to 970 feet of clayish limestone rocks like those at Goderich, and 30 to 40 feet of brine bearing shales, penetrating finally 15 feet in the Rock Salt. The well is 1185 feet deep. I obtained some salt, represented to have been made from the brine of that well; if such is the case, its composition must prove quite suggestive in regard to the general character of the Salt bearing basin, which apparently underlies that section of Canada. The Salt was of a hard grain and had been subjected to much handling.

Not being familiar with the mode pursued in its manufacture, I prefer to retain the results of my analysis. The geological character of the rocks which inclose the Salt resource at Goderich and its vicinity, may be surmised from the geological maps of Canada, published by the distinguished officers of the



geological board of Canada—they are the same which out-crop in our vicinity—the shales of the Onondaga Salt group. Judging merely from a chemical point of view, I presume Goderich and its vicinity to be at the head of an extensive Salt deposit, resting in a depression of the Onondaga Salt group, which, if my results in regard to the Salt obtained at Clinton may be relied on, appears to incline towards the South East or South. Although no systematic investigation of the Salt resources has as yet been made, sufficient has transpired in consequence of accidental observation, to entitle to the belief in its extensive character.

*Resources of Wood and Lumber for Fuel, Barrels, construction of Buildings &c.*

Very little remains to be said in this connection. Canada and the adjoining lake shores are the acknowledged store houses for these demands. Syracuse draws a large proportion of its materials for the manufacture of barrels from these localities. The general character of the grounds adjoining Lake Huron and Georgian Bay, is that of a well timbered wood-land, The cord of wood sells at Goderich, in the general market, for two dollars; what its price will be, if wood-land at the present market price (ten to fifteen dollars) is secured in localities along the lake shore, which, as a general rule, as I am informed, is on account of its elevation easy of access, can be better decided by parties acquainted with the details bearing upon that question, than I am prepared to state. The price of chopping a cord of wood has been formerly fifty cents—lately seventy-five cents. Even if the forests should become exhausted, the bituminous Coal of Ohio by way of Cleveland, might be made available under proper management, at less cost than the Salt Company of Onondaga under its present arrangement is able to secure. We have therefore to concede the correctness of the second advantage claimed at Goderich.

*Facilities of Transportation.*

Goderich being located at the termination of the Grand Trunk R. R. has all the advantages for inland trade so far as R. R.

transportation can be made serviceable. A number of the contemplated works are clustering around the terminus of the R. R.; the R. R. Company has consented to the construction of switches from these works to its Freight Depot; the loading of cars for the interior trade can consequently be done to some extent at least at the works; a connection by rails of the R. R. depot, in the town of Goderich, with the R. R. freight house and wharfs inside of the harbor, furnishes also direct communication with Lake Huron. The packed salt may be thus transferred upon sailing vessels with but little delay, and I presume but small expenses, for it may ultimately prove to be the best policy of the R. R. Company, as far as freighting business is concerned, to establish reasonable rates, for they can expect to control only the inland trade within a limited district. The facilities offered by the Maitland river, which terminates in the harbor of Goderich, must eventually check a R. R. monopoly even within the Province of Ontario.

I have mentioned, on a former occasion, that the peculiar way in which the bed of the Maitland river has been worn out towards its termination, would favor projects to render that river from the harbor upwards for probably several miles navigable, along localities most recommendable for the erection of works. The salt once on board of vessels, has all the advantages of lake transportation. Parties familiar with the lake trade state, that ten cents might be considered a high figure for carrying a barrel of salt to Chicago, if arrangement for regular transportation could be made. The river outlet may act as I mentioned before, as a check against high freight rates of the R. R. Company, for the salt may be carried upon that route through Lake Huron and Georgian Bay, in consequence of which it may not only be distributed along the shores of the latter, but be sent by way of the Collingwood—Toronto R. R. into the heart of Canada.

Viewing, after these few remarks, the map of the northern and north-western portion of this Continent we feel inclined to yield to Goderich great facilities of transportation to most important commercial centers.



I have to make but a few remarks more before concluding this Report. Passed experience has apparently settled the question of the success of the Goderich salt, as far as the home market is concerned. The production of salt at present is but one sixth compared with their home demand of about six hundred barrels per day. Six to eight, like their present boiling works, could furnish that demand ; and as there are already six to seven wells located and partly started in addition to the one in running order, the question arises, what will be next in order. We may answer that question to ourselves; they will be forced to look for access to our markets.

To carry that design into effect, they meet the provision of our present tariff, which is twenty-four cents (gold) on one hundred pounds of packed salt and eighteen cents (gold) on one hundred pounds of loose salt. How far they may be enabled to overcome that circumstance, may be adduced from the following figures. Syracuse Fine Salt sold at Chicago for two dollars and fifty cents during the past season, as I am informed. The salt works at Goderich with but  $34\frac{1}{2}$  bushels to one cord of wood, cannot expect to compete with the Syracuse salt: it falls three bushels at least behind in the yield of the same kind of fuel at Syracuse ; but its chances for competition change considerable, as soon as the full amount of salt from the Goderich brine shall be produced with probably less labor. I stated, that that brine contained fifty per cent. of salt more, than the brines of Syracuse, which additional amount to secure is not a new problem to be dissolved ; it is practically settled in regard to fine boiled salt in England. To count fifty-two bushels to one cord of hard wood might be but fair. In regard to salt made by solar evaporation, it admits of no doubt, that the full difference in regard to the concentration of the Goderich and Syracuse brine, will find its corresponding figures in the final yield. Taking this view I can but agree with parties engaged in the salt business at Goderich, that seventy cents per barrel will be, before long, their manufacturing price at Goderich. Taking this figure, which seems to be by no means too low, we find the following result :

	<i>Gold, [140]</i>	<i>Currency.</i>
One Barrel of Salt,	70	98
Freight to Chicago,	10	14
Duty on 280 lbs. } Salt, [packed] }	67 2-10	94 8-100
Storage, selling, land- } ing, etc. at Chicago, }	21 42-100	30
	<hr/>	<hr/>
	1 68 62-100	2 36 8-100

These figures would leave about fourteen cents profits on one barrel of Fine Salt. Arrangements for shipping the salt loose, which might be perfected with less inconvenience and expense at Goderich than at Syracuse, would give a still more decided profit to the operators at Goderich. The present salt works at Goderich, if once placed in the condition previously mentioned, might still realize from 22 to 24 per cent. profit on the capital invested. Without the existence of a protective tariff, the result is too obvious to need further comment.

SYRACUSE, Jan. 16, 1868.

CHAS. A. GOESSMANN.



